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ABSTRACT

Instructional supervision is regarded as a resource to be managed by teachers for the improvement of instruction. Major problems in research on teaching effectiveness--operational definition of teaching effectiveness; systematic description and observation of teaching behavior; and systematic modification of teaching behavior in specified directions--are discussed. The Diagnostic Instrument of Supervision (DIOS), which employs student responses, is designed to identify strengths and weaknesses in the classroom to facilitate instructional improvement. Its development and evaluation are described. It is concluded that while teachers and supervisors use DIOS results in their planning, they have difficulty effecting changes which provide more favorable student responses. The instrument, item scores, and a report to the teacher which presents and explains DIOS results are included. (PR)

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Evaluation of a Diagnostic Instrument of Supervision

Supervision as a Resource to be Managed by Teachers

Contemporary instructional supervision faces a noble challenge. At its finest, supervision can be a resource to be managed by teachers for the improvement of instruction and for their professional development. Powerful concepts, principles, techniques, and instruments are now available to supervisors and teachers who accept this challenge. Because teachers and not supervisors are directly responsible for instruction, only teachers can be directly involved in the improvement of instruction. Therefore, the management of supervision as a resource for the improvement of instruction ought to be primarily the teacher's responsibility. If the teacher does not have the professional preparation to discharge this responsibility effectively, then it becomes the supervisor's responsibility to assist the teacher in developing the skills the teacher will need for this purpose.

Hierarchical distinctions make it difficult for supervisors to accept the concept that their participation in the supervisory process should be managed by the teachers with whom they work. When supervision is only partially effective or wholly ineffective, supervisors find it easy to look outside themselves for the explanation of the outcomes of their efforts. It is true that supervisors are handicapped by the general lack of adequate solutions to four major problems in the research on teaching effectiveness: (1) operational definition of teaching effectiveness; (2) systematic description of teaching behavior; (3) systematic observation of teaching behavior; and (4) systematic modification of teaching behavior in specified directions. These problems will be discussed briefly in turn.

Operational Definition of Teaching Effectiveness

Teaching effectiveness can be inferred from two kinds of observations or evidence. First, measures of student learning could also be measures of teaching effectiveness if it were assumed that student learning depends only on variables that the teacher controls. The increasing use of behavioral objectives and similar specifications of desired outcomes for the learning process makes it easier now than in the past to assess student progress over any interval of time. It would be as unfair to give the teacher all the credit for whatever progress can be measured as to hold the teacher solely

responsible if student progress falls short of expectations. If theories of teaching behavior could accurately predict the effects of various teaching practices in given circumstances, then it would be possible to define teaching effectiveness in a second way--in terms of measures of observable teaching behavior. It will probably be a long time before theories of teaching behavior become adequate for this purpose. Therefore, the operational definition of teaching effectiveness remains a problem to be solved cooperatively and idiosyncratically by each teacher and supervisor within the limits acceptable to the school administration of the district in which the teacher is employed.

Systematic Description of Teaching Behavior

Research on the problem of systematic description of teaching behavior has progressed rapidly in the past decade. So many category systems have been developed that, with the assistance of audiotapes and videotapes, it is possible for the teacher or supervisor to make an accurate record of almost any observable teaching behavior. Still there is little agreement on the interpretation of much of the behavior that is recorded. This question reflects the uncertainty that prevails in the operational definition of teaching effectiveness, which was described above.

Systematic Observation of Teaching Behavior

The existence and use of many different category systems for describing teaching behavior suggest that different sets of variables are significant for different learning environments or even the same environment at different times. The problem of selecting categories for observation remains one of the most unyielding problems in the evaluation of teaching effectiveness. There are now so many mechanical and electronic aids to classroom observation that once the decision of what to observe has been made the only remaining problem should be that of providing adequate resources for observations to be made when they are needed.

Systematic Modification of Teaching Behavior in Specified Directions

Even when supervisors and teachers agree on some operational definition of teaching effectiveness and the problems of systematic description and observation of teaching behavior have been solved to the satisfaction of the individuals concerned, the real test of supervision remains. Who should decide the directions in which modification of teaching behavior should aim? Who can

suggest procedures by which the teacher's behavior can become more effective? Who can persuade the teacher to implement these procedures without distortion? Who will be concerned about the effects of these modifications on the teacher as a person and as a member of a profession? Neither the supervisor nor the teacher can accomplish these tasks alone. The quality of interaction between the supervisor and the teacher in answering these questions will, as much as anything else, determine the quality of supervision and the extent of improvement of instruction. Of course, any improvement in instruction depends on the students' behavior as well as the teacher's behavior. Therefore, it would be unwise to exclude students from the formal supervisory process. Students represent a resource in supervision that teachers could learn to manage effectively. Although there have been many attempts to involve students in tne evaluation of their classes and their learning, few of these efforts have incorporated the students directly in the planning and implementation of systematic modifications of teaching behavior in specified directions. Until recently, not many students seemed interested in assuming this kind of responsibility. Moreover, it has been difficult for teachers to manage students as a resource in supervision because they have doubted the students' seriousness and ability even as managers of their own learning. That is, if students customarily participated actively and wisely in the management of resources for their own learning, teachers might be willing to invite them to participate formally in supervision. Teachers, like supervisors, are sometimes overly conscious of hierarchical distinctions that make it seem inappropriate for them to welcome others as partners in the improvement of instruction. The real stumbling block is the myth that in order to deserve respect and approval a teacher should be free of any weakness or failure to achieve desired results. When realistic estimates are made of the abilities and limitations of teachers and administrators, the full power of supervision can be focused on the improvement of instruction and the growth of the professional staff of a school.

Development of a Diagnostic Instrument of Supervision

In 1963 Seager developed a diagnostic instrument of supervision (DIOS) to provide secondary school teachers and their supervisors with each others' and the students' opinions of how much improvement was desirable in six areas based on their responses to twenty-nine items describing what a class might be like. The six areas and the twenty-nine items are shown in the "Report to the Teacher" (see attachment). The scoring system for determining area scores

is also explained in the "Report to the Teacher." Seager's original research was reported in his doctoral dissertation, "Development of a Diagnostic Instrument of Supervision," (Harvard Graduate School of Education, 1965). Subsequent research by Seager and others using DIOS alone or with other measures of student attitudes and achievement as well as with classroom observation by supervisors makes it possible at this time to examine the potential of the instrument for broader use as well as some aspects of the reliability and validity of the instrument.

Because DIOS was intended as a diagnostic instrument to assist in the identification of strengths and weaknesses in individual classes so that teachers and supervisors could plan together for improvements in instruction, summaries and analyses of the teacher's, supervisor's, and students' responses to DIOS were provided to the teacher and supervisor shortly after DIOS was administered in one or more of the teacher's classes. After an interval of about six weeks, DIOS was administered a second time in the same classes. T-tests were made to determine whether there were significant changes in the students' responses from first to second administration of DIOS. Additional data were collected in the classes of other teachers who received reports of results only after the second administration of DIOS. A two-way analysis of variance was made to compare changes over time between the group receiving reports shortly after the first administration of DIOS and the group receiving reports only after the second administration. The analysis of variance showed a significant difference between the two groups on both administrations of the instrument but no significant difference in the changes in area scores from first to second administration of the instrument for the two groups. T-tests showed significant changes in some area scores for teachers who received the "Report to the Teacher" after the first administration.

Evaluation of DIOS

A second purpose of the research with DIOS was to determine whether the initial grouping of the twenty-nine items in six areas would be supported by a factor analysis of the students' responses to the first administration of DIOS. A factor analysis of 1593 student responses to DIOS supported three of the six areas in which Seager grouped the items. A second factor analysis of more than 5000 student responses is underway.

Reports of classroom observations by supervisors have been analyzed to check the validity of responses to DIOS and to provide a basis for systematic modification of teaching behavior in specified directions. Written comments

appended to the responses to individual items were examined for the same purposes. Teachers and supervisors were free to work in any way they chose to plan and effect changes in the classes.

In other investigations, Harshbarger, Hartman, Tygard, and Voltz collected data on student achievement in a variety of courses in secondary schools and at the undergraduate level in addition to responses to DIOS. Harshbarger and Hartman also administered their own instruments for measuring students' attitudes toward their college mathematics course. Voltz used DIOS and Harshbarger's attitude survey in evaluating the outcomes of a student directed curriculum in linear algebra which he designed and implemented. Data collected with DIOS were used in the interpretation of results of innovative teaching strategies that were compared with results in comparable classes taught in more routine ways by other instructors. Tygard prepared strategies of supervision for department chairmen to use with beginning ninth grade English teachers. She measured changes in the students' achievement and in their responses to DIOS in five inner city schools. In each school the department chairman was encouraged to use the supervisory strategies with just one of two beginning teachers. Comparisons were made between the results in the classes of teachers receiving supervision based on Tygard's strategies and the classes of other beginning teachers without such supervision. Tygard also tape recorded interviews with the department chairman and beginning teacher receiving supervision in each school.

From 1963 to 1971 more than 5000 student responses to DIOS have been collected and analyzed. Classes from seventh grade through first year college have participated in the research with DIOS. Student teachers, graduate teaching interns, experienced teachers, and master teachers have received reports based on their responses and the responses of students in their classes. The data have been collected in two metropolitan areas--Boston and Pittsburgh--in inner city, outer city, and suburban schools and universities.

T-tests on data collected with DIOS in the classes of individual teachers generally have shown significant changes over time in students' responses when innovative teaching methods were being used and when structured supervision was being employed. In classes without innovative teaching methods and without structured supervision the results with DIOS have been stable over time. The variation in responses among students in the same class has often been large, indicating that students in the same class sometimes form very different opinions of how much improvement is desirable in the six areas in which the

twenty-nine items have been grouped. Many classes produced results showing very favorable student opinions of their classes. Many other classes produced evidence of moderate dissatisfaction on the part of students with some or all of the areas of the teaching performance sampled by DIOS. Experienced teachers generally were more successful than beginning teachers, graduate interns, and student teachers in Area II, Proximity of Pupils' Objectives to Teacher's Objectives for Them, based on student responses to DIOS. The average of 3480 student responses to each item is shown as an item score in the attached list of Relative Strengths and Relative Weaknesses. The range of possible item scores is from 0.00 (no improvement desirable) to 3.00 (much improvement desirable).

Conclusion

It is possible at this time to say that teachers and supervisors who have used DIOS value the students' responses as well as each others'; they use the results in their joint planning but have difficulty effecting changes in six weeks to three months that result in more favorable student responses to DIOS, unless the teachers are systematically trying out teaching methods new to them that they have designed themselves. Teachers who are creative in their teaching have used DIOS creatively. For others DIOS has supplied interesting data but, by itself, has had no significant impact on systematic modification of teaching behavior. More powerful supervisory techniques in planning with teachers (which are available but seldom called upon) could be expected to increase the benefit to teachers and supervisors to be derived from DIOS.

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Presented to AERA
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As part of a research study of communication between teachers and pupils you are asked to express your real opinions about the classes you have had with this teacher in this course this year. Do not put your name on this survey. No-one will know which responses are yours. A summary of all the responses will be used by the teacher in planning future classes. Use pen or pencil to complete the following:

Date _____ Teacher _____

Period _____ Subject _____ Grade _____ Boy _____ Girl _____

You were born on _____
Month Day Year

The items listed below and over the page tell what a class might be like. Each item suggests an area of possible improvement in this class. State your opinion of how much improvement is desirable in this class in the area suggested by each item. If you think much improvement is desirable, circle M at the left of the item. If you think some improvement is desirable, circle S. If you think little improvement is desirable, circle L. If you think no improvement is desirable, circle N. Here is a sample item and one pupil's response to it.

M S L N 30. When the teacher calls on a pupil, the other pupils can hear the pupil's response.

The pupil circled N because he thought no improvement was desirable in the area suggested by this item.

Consider each item carefully. Do not leave any item blank. Choose the response closest to your opinion. If you want to explain your response, write in the space after the items. You will have about ten minutes to complete your responses. Study quietly when you have finished. Begin when you are sure you understand the directions.

Remember: M means much improvement desirable; S means some improvement desirable;
L means little improvement desirable; N means no improvement desirable.

M S L N 1. The teacher understands the pupils' difficulties and helps them see how to correct their mistakes.

M S L N 2. The teacher uses good ideas suggested by the pupils.

M S L N 3. The pupils understand the teacher's explanations.

M S L N 4. Sometimes in this course pupils do work that is not required but is valued by the teacher.

M S L N 5. The teacher understands what pupils mean even when they find it difficult to put their thoughts into words.

M S L N 6. There is never any undue fooling around in this class.

M S L N 7. Pupils know which things are important for them to learn.

M S L N 8. The things the teacher asks pupils to do are challenging.

M S L N 9. The things the teacher asks pupils to do are not impossible.

M S L N 10. The teacher makes the pupils feel important in this class.

M S L N 11. Pupils have enough opportunity to practice before tests.

(The list of items is continued over the page.)

Relative Strengths and Weaknesses among Twenty-Nine Items

Based on the Responses from 3480 Pupils

Relative Strengths toward the top of the page

Item Score	Item	
0.52	9.	The things the teacher asks pupils to do are not impossible.
0.63	12.	The teacher is careful not to hurt the pupils' feelings.
0.65	28.	The teacher treats the pupils fairly.
0.66	24.	The teacher cares whether the pupils are doing well or not.
0.67	23.	When pupils want to ask questions or tell the teacher something, they are encouraged to do so.
0.76	17.	The teacher really seems to enjoy teaching these pupils.
0.81	11.	Pupils have enough opportunity to practice before tests.
0.85	22.	There seems to be a good reason for the things the teacher does in class.
0.88	19.	The teacher uses a marking system pupils understand and respect.
0.95	2.	The teacher uses good ideas suggested by the pupils.
0.95	13.	Tests in this class help pupils learn important things.
1.00	26.	The teacher knows what pupils are doing and what's going on in class.
1.00	8.	The things the teacher asks pupils to do are challenging.
1.03	20.	Pupils learn from each other in this class.
1.08	18.	Pupils learn important things in this class by thinking for themselves.
1.10	1.	The teacher understands pupils' difficulties and helps them see how to correct their mistakes.
1.11	14.	Pupils answer most of the teacher's questions acceptably.
1.13	5.	The teacher understands what pupils mean even when they find it difficult to put their thoughts into words.
1.14	21.	The teacher helps pupils grow in self-confidence in this class.
1.21	10.	The teacher makes the pupils feel important in this class.
1.26	27.	The pupils like to cooperate with the teacher.
1.27	4.	Sometimes in this course pupils do work that is not required but is valued by the teacher.
1.30	7.	Pupils know which things are important for them to learn.
1.31	3.	The pupils understand the teacher's explanations.
1.36	29.	Time seems to go by quickly for the pupils in this class.
1.40	15.	Homework for this class is useful and interesting to the pupils.
1.41	25.	Pupils get their work done on time.
1.47	16.	Most pupils usually do well on the tests the teacher gives.
1.68	6.	There is never any undue fooling around in this class

Relative Weaknesses toward the bottom of the page

M S L N 12. The teacher is careful not to hurt the pupils' feelings.

M S L N 13. Tests in this class help pupils learn important things.

M S L N 14. Pupils answer most of the teacher's questions acceptably.

M S L N 15. Homework for this class is useful and interesting to the pupils.

M S L N 16. Most pupils usually do well on the tests the teacher gives.

M S L N 17. The teacher really seems to enjoy teaching these pupils.

M S L N 18. Pupils learn important things in this class by thinking for themselves.

M S L N 19. The teacher uses a marking system pupils understand and respect.

M S L N 20. Pupils learn from each other in this class.

M S L N 21. The teacher helps pupils grow in self-confidence in this class.

M S L N 22. There seems to be a good reason for the things the teacher does in this class.

M S L N 23. When pupils want to ask questions or tell the teacher something they are encouraged to do so.

M S L N 24. The teacher cares whether the pupils are doing well or not.

M S L N 25. Pupils get their work done on time.

M S L N 26. The teacher knows what the pupils are doing and what's going on in class.

M S L N 27. The pupils like to cooperate with the teacher.

M S L N 28. The teacher treats the pupils fairly.

M S L N 29. Time seems to go by quickly for the pupils in this class.

If there are any other areas in which you think improvement in this class is desirable, please describe these areas briefly in the space below.

Report to the Teacher

Preliminary Note

This report is intended to contribute to the teacher's and supervisor's analysis of the strengths and weaknesses in the teaching and, hence, to help them plan for future teaching performances. Data from observation of the teaching will aid the teacher and the supervisor in interpreting the pupils' responses to the instrument.

Contents of this Report

1. Relationships among the Items
2. Organization of the Statistical Summaries
3. General Statements about the Items in each Area
4. Remarks about the Responses to the Instrument
5. Statistical Summaries of the Responses

Relationships among the Items

The twenty-nine items are interrelated. To help make these relationships clear the items have been grouped in the areas named below. Some items appear in two areas.

Area I Pupils' Productive Behavior
Area II Proximity of Pupils' Objectives to the Teacher's Objectives
Area III Teacher's Inclusive Behavior
Area IV Teacher's Organization of Tasks
Area V Teacher's Procedures for Evaluating Learning
Area VI Teacher's Response to Pupils' Communicative Behavior

The general statements following the list of items in each area describe some relationships that are relevant to most teaching situations. The remarks relate these general statements to the responses in your classes and suggest some additional relationships that may be relevant to your teaching. You are encouraged to examine the general statements and remarks critically and to investigate other relationships that occur to you.

Organization of the Statistical Summaries

A scoring system has been applied to the pupil responses (M 3, S 2, L 1, N 0, Blank 0) and a total score computed for each item. An average score per item per pupil has been computed for each of the six areas. These area scores range from 0.00 (no improvement desirable) to 3.00 (much improvement desirable). Thus, the lower the area score, the more favorable is the pupil response, on the average, in that area.

The total scores computed for each item permit ranking the items on a strength-weakness continuum, as is done in the statistical summaries. The item with the lowest score (most favorable pupil response) is listed first in the column headed "Relative Strength," then the item with the next lowest score, and so on. The item with the highest score (least favorable pupil response) is listed first in the column headed "Relative Weakness," then the item with the next highest score, and so on. Thus, the strength-weakness continuum is represented by the arrangement of the items in a "U" shape with the items nearest the extremes of the continuum listed at the top in each column. This arrangement facilitates comparison of items that, according to the pupils, represent the greatest relative strengths and weaknesses in the areas of your teaching sampled by this instrument.

Area I: Pupils' Productive Behavior

Items: 4. Sometimes in this course pupils do work that is not required but is valued by the teacher.
14. Pupils answer most of the teacher's questions acceptably.
16. Most pupils usually do well on the tests the teacher gives.
18. Pupils learn important things in this class by thinking for themselves.
20. Pupils learn from each other in this class.
25. Pupils get their work done on time.

General Statement:

There are two subgroups of items in this area. Items 4, 18, and 20 deal primarily with pupil-initiated productive behavior. Items 14, 16, and 25 deal primarily with teacher-initiated pupil productive behavior or, more simply, required work.

The responsibility for improvement in most areas of the teaching performance is shared by the pupils and the teacher. For example, pupils' test performance could presumably be improved by efforts of the pupils alone (e.g., improved test construction), or by the teacher and pupils jointly (e.g., more requests for explanation when pupils don't understand followed by clearer explanations by the teacher).

Remarks:

Area II: Proximity of Pupils' Objectives to the Teacher's Objectives

Items: 6. There is never any undue fooling around in this class.
15. Homework for this class is useful and interesting to the pupils.
25. Pupils get their work done on time.
27. The pupils like to cooperate with the teacher.
29. Time seems to go by quickly for the pupils in this class.

General Statement:

If pupils' objectives are unrelated to or opposed to the teacher's objectives for the pupils, it is unlikely that pupils will find the classwork and homework useful and interesting. Their impression of the passage of time in class may be that it does not go quickly enough for them. In such a situation the pupils may become uncooperative and may fall behind in their work. They may express their ignorance of or resistance to the teacher's objectives by "fooling around."

Remarks:

Area III: Teacher's Inclusive Behavior

Items: 10. The teacher makes the pupils feel important in this class.
12. The teacher is careful not to hurt the pupils' feelings.
17. The teacher really seems to enjoy teaching these pupils.
21. The teacher helps pupils grow in self-confidence in this class.
24. The teacher cares whether the pupils are doing well or not.
28. The teacher treats the pupils fairly.

General Statement:

This area is concerned with the interpersonal relationships between the teacher and the pupils. Although the items in this area deal exclusively with the teacher's behavior, pupils share responsibility for interpersonal relationships in the classroom.

Items 10 and 21 refer to the effect of the teacher's behavior on the pupils' feelings of importance and self-confidence in the class. Some pupils consider it unnecessary or even inappropriate for the teacher to make them feel important and to help them gain self-confidence. Other pupils, especially some of the younger ones, value this kind of support from the teacher.

Remarks:

Area IV: Teacher's Organization of Tasks

Items:
8. The things the teacher asks the pupils to do are challenging.
9. The things the teacher asks the pupils to do are not impossible.
13. Tests in this class help pupils learn important things.
15. Homework for this class is useful and interesting to the pupils.
22. There seems to be a good reason for the things the teacher does in this class.

General Statement:

Individual differences in ability among the pupils make it difficult for the teacher to select tasks that challenge all the pupils but are not impossible for some pupils. This problem is complicated by individual differences in interest and objectives.

If tests are primarily instruments for evaluation and if the chief purpose of evaluation is to promote learning, then tests should contribute significantly to pupils' learning. The pupils' opinions of which tasks would be useful and interesting to them will affect their behavior and, hence, their learning. If the teacher's organization of tasks shows respect for the pupils' interests and objectives, the tasks will seem reasonable to them.

Remarks:

Area V: Teacher's Procedures for Evaluating Learning

Items: 3. The pupils understand the teacher's explanations.
7. Pupils know which things are important for them to learn.
11. Pupils have enough opportunity to practice before tests.
16. Most pupils usually do well on the tests the teacher gives.
19. The teacher uses a marking system pupils understand and respect.

General Statement:

The teacher's explanations and the pupils' practice usually play a major part in the pupils' learning. Pupils who don't know which behaviors to practice may be inadequately prepared for tests. Marks are often used to convey the teacher's evaluation of the pupils' learning. If great importance is attached to marks, then the pupils' behavior will be affected by the extent of their understanding and respect for the teacher's marking system.

Remarks:

Area VI: Teacher's Response to Pupils' Communicative Behavior

Items:
1. The teacher understands pupils' difficulties and helps them see how to correct their mistakes.
2. The teacher uses good ideas suggested by the pupils.
5. The teacher understands what pupils mean even when they find it difficult to put their thoughts into words.
14. Pupils answer most of the teacher's questions acceptably.
23. When pupils want to ask questions or tell the teacher something they are encouraged to do so.
26. The teacher knows what the pupils are doing and what's going on in class.

General Statement:

Some communications from the pupils to the teacher are open and direct. Others are subtle and indirect. In order to respond constructively, the teacher needs to understand the intent as well as the substance of pupils' communications. Identification of the pupils' difficulties is often hampered by their inability to communicate effectively. The problem is compounded if the teacher discourages questions and statements when the pupils seek help.

The teacher's response helps pupils decide whether they have answered questions acceptably and whether their ideas are good. It also affects their desire to answer further questions and suggest new ideas.

The teacher cannot respond effectively to behavior he doesn't observe. When pupils believe their behavior will be unobserved or ignored by the teacher, they are likely to pursue their own objectives rather than the teacher's objectives for them.

Remarks: